AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of transmitting a radio signal with polarization diversity, comprising the steps of: transmitting a plurality of versions of the radio signal having different polarizations from a first station to a second station; and adaptively controlling respective transmission powers of said versions of the radio signal according to measurements carried out by the first station on signals transmitted by the second station, wherein an optimal transmission power distribution of the radio signal between the polarizations is estimated on the basis of minimizing a cost function relative to a quality of the signal received by the second station, and the transmission power is distributed between said versions of the radio signal in accordance with the estimated distribution.

2. (Original) The method as claimed in claim 1, wherein said versions of the radio signal are transmitted simultaneously.

3. (Cancelled)

4. (Currently Amended) The method as claimed in claim [[3]] 1, wherein the cost function to be minimized measures an error probability in receive mode.

5. (Currently Amended) The method as claimed in claim [[3]] 1, wherein transmission parameters for signals transmitted by the second station to the first station and parameters for the receiving by the second station of said versions of the radio signal transmitted with polarization diversity by the first station are measured, and said measured parameters are transmitted to the first station in order to estimate the optimal transmission power distribution.

6. (Original) The method as claimed in claim 5, wherein said second station is designed to transmit with polarization diversity, the method further comprising the steps of:

- for each transmit polarization, measuring a mean power contribution of at least some of the signals transmitted by the second station;
- for at least some of the signals transmitted in a defined polarization by the first station to the second station, measuring a mean power contribution of the noise that interferes in receive mode with the useful signal relating to said transmitted signal; and
- for each transmit polarization, evaluating at the first station power transfer coefficients in a radio propagation channel of at least some of the signals transmitted by the second station.

7. (Original) The method as claimed in claim 6, wherein the mean noise power contribution and mean transmission power contribution measurement steps are executed in the second station and the measured mean noise power contribution and mean transmission power contribution are transmitted to the first station for estimating the optimal distribution of the transmission power.

8. (Original) The method as claimed in claim 5, wherein said second station is designed to transmit with polarization diversity, wherein the mean power contribution of the signals transmitted by the second station is substantially identical for each polarization, the method further comprising the steps of:

- measuring a, mean power contribution of at least some of the signals transmitted by the second station;
- for at least some of the signals transmitted in a defined polarization by the first station to the second station, measuring a mean power contribution of the noise that interferes in receive mode with the useful signal relating to said transmitted signal; and
- for each transmit polarization, evaluating at the first station power transfer coefficients in a radio propagation channel of at least some of the signals transmitted by the second station.

9. (Original) The method as claimed in claim 8, wherein the mean noise power contribution and mean transmission power contribution measurement steps are executed in the second station and the measured mean noise power contribution and mean transmission power contribution are transmitted to the first station for estimating the optimal distribution of the transmission power.

10. (Currently Amended) A radiocommunication station with polarization diversity, comprising means for transmitting a plurality of versions of a radio signal having different polarizations to a remote radiocommunication station, means for measuring parameters on the basis of signals transmitted by said remote station, and means for adaptively controlling the respective transmission powers of said versions of the radio signal according to said measured parameters, wherein the means for adaptively controlling the transmission powers comprise means for estimating an optimal distribution of the transmission power of the signals transmitted with a defined polarization, on the basis of minimizing a cost function relating to the quality of the signal received by the remote station, and means for driving the transmission means so as to distribute the transmission power according to the estimated distribution.

11. (Original) The radiocommunication station as claimed in claim 10, wherein the transmission means are coupled to n_pol antennas, n_pol being a number greater than or equal to two, and are designed to transmit from each antenna a radio signal in one polarization from among n_pol polarizations.

12. (Cancelled)

13. (Currently Amended) The radiocommunication station as claimed in claim [[12]] 10, wherein the means for estimating the optimal transmission power distribution comprise means for minimizing an error probability in receive mode by the remote station.

14. (Currently Amended) The radiocommunication station as claimed in claim [[12]] 10, further comprising means for obtaining parameters for the transmitting of signals by the remote signal and for the receiving of signals transmitted to the remote station, cooperating with the means for estimating the optimal transmission power distribution.

15. (Original) The radiocommunication station as claimed in claim 11, further comprising receiving means coupled to the n_pol antennas sensitive in receive mode to the n_pol polarizations, and wherein the means for estimating the optimal transmission power distribution cooperate with means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the. remote station and with means for obtaining parameters for the receiving of signals transmitted by the remote station.

16. (Original) The radiocommunication station as claimed in claim 15, wherein the means for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for obtaining, for each of the n_pol polarizations, a mean power contribution of at least some of the signals transmitted by the remote station and means for estimating power transfer coefficients for signals transmitted by the remote station in each of the n_pol polarizations and received on each of the n_pol antennas.

17. (Original) The radiocommunication station as claimed in claim 15, wherein the means) for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for obtaining a mean power contribution of at least some of the signals transmitted by the remote station and means for determining power transfer coefficients for signals transmitted by the remote station in each of the n_pol polarizations and received on each of the n_pol antennas.

18. (Original) The radiocommunication station as claimed in claim 15, wherein the means for obtaining parameters for the receiving of signals transmitted by the remote station comprise means for estimating symbols transmitted by the remote station in each of the n_pol polarizations, and received on each of the n_pol antennas, and. means for combining the estimated symbols.

19. (Original) The radiocommunication station as claimed in claim 14, wherein the means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the remote station comprise means for obtaining, for at least one of the signals transmitted to the remote station in one defined polarization among n_pol, a measurement of a mean power contribution of the noise that interferes with the useful signal relating to said transmitted signal.

20. (Original) The radiocommunication station as claimed in claim 14, wherein the means for obtaining parameters for the transmitting of signals by the remote station and for the receiving of signals transmitted to the remote station comprise means for measuring, for each of the n_pol transmission polarizations, a mean power contribution of at least some of the signals transmitted by the remote station.

21. (Original) The radiocommunication station as claimed in claim 11, wherein n_pol=2.

22. – 28. (Cancelled)